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COLES'S
MUSKETRY
CATECHISM

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MUSKETRY CATECHISM:

FOR THE USE OF BOTH SERVICES AND RIFLE CLUBS.

BY

CAPTAIN COLES,

1ST THE ROYAL REGIMENT.

INSTRUCTOR OF MUSKETRY, HYTHE.

Fifth Edition,

REVISED AND ENLARGED.

London:
W. CLOWES & SONS, 14, CHARING CROSS;
COLCHESTER: EDWARD BENHAM.

1861.

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MUSKETRY CATECHISM.

Q. Who is responsible in every battalion for the rifle training of the non-commissioned officers and privates?

A. The commanding officer.

Q. Is he required to make himself acquainted with the rules laid down for the rifle training of his battalion?

A. Yes: as it is considered the most important part of a soldier's training.

Q. What is he also particularly required to do?

A. To give his personal superintendence to the drill and practice of the companies under instruction.

Q. By whom is all correspondence to be conducted?

A. The commanding officer.

Q. Is he responsible for the accuracy of all returns?

A. Yes: and is required to give any explanation on the subject which may be called for by the Inspector General of Musketry.

Q. Are the field officers, captains, and subalterns, to make themselves acquainted with the theory and practice of musketry?

A. Yes: as it is a component part of battalion and company drill.

Q. How often are commanding officers of battalions (*when the annual course is not proceeding*) to assemble their officers?

A. *At least* once in each half year.

Q. How often the non-commissioned officers?

A. Occasionally,—by squads or companies.

Q. With what view?

A. That the officer instructor (having previously explained the theoretical principles) may advance deeper into the subject.

Q. Who is charged with the musketry training of every battalion armed with the rifle or rifle carbine?

A. The officer instructor of musketry.

Q. What are his duties?

A. The entire musketry training of young officers and recruits, as well as with the theoretical and preliminary instruction of the other officers and soldiers of the battalion, *annually*.

Q. What must he have obtained to enable him to hold the appointment?

A. A first class certificate from the head quarters establishment at Hythe.

Q. What is he to be considered as one of?

A. The regimental staff, and to be exempted from all garrison and regimental duties.

Q. What are the peculiar privileges of an officer holding the permanent appointment of Instructor of Musketry to a depot battalion.

A. An overslaugh on the roster for duty with the service companies, which he is not to be required to join without special orders from the Commander in Chief.

Q. Is he allowed an officer to assist him?

A. A subaltern is to be appointed to act as assistant *officer instructor*.

Q. What must he have obtained to enable him to hold the appointment?

A. A certificate from the head quarters at Hythe.

Q. How many battalion serjeant instructors are to be appointed to each corps?

A. One or more serjeants.

Q. What are their duties?

A. They are to attend all target drills and practices and superintend the company instructors, and are to be employed exclusively in the rifle instruction of the battalion under the officer instructor.

Q. What duties are they exempted from?

A. All regimental, garrison, and barrack duties, and are not to be subject to the orders of any non-commisioned officer, except as regards discipline.

Q. How do they rank?

A. Second serjeant instructors next to the quarter master serjeants (in the guards with the drill serjeants according to seniority); third class, next to the colour serjeants.

Q. Who is to be appointed company instructor o every troop or company of a battalion?

A. The colour serjeant or troop serjeant major, or, in his absence, the next senior serjeant.

Q. Is he to attend with his company when going through the preliminary drill, and the target or judging distance practice?

A. Yes: under the orders of his captain and the officer and battalion serjeant instructors.

General Course of Instruction.

Q. What is to be proceeded with after the recruit has attained a thorough knowledge of the platoon exercise?

A. His course of musketry drill and practice.

Q. To this *great object* can too much care and attention be devoted?

A. No: because the rifle is placed in the soldier's hands for the destruction of his *enemy*, and his *own safety* depends much upon his efficient use of it.

Q. What cannot be too strongly impressed upon the mind of the soldier?

A. That *every man* who has no defect in his eyes, may be made a good shot.

Q. What do all his other instructions in marching and manœuvring do for him?

A. Nothing more than place him in the best possible situation for using his weapon with effect.

Q. What then is a soldier who cannot shoot considered?

A. Useless, and an incumbrance to the battalion.

Q. Into how many heads is the instruction in musketry divided?

A. Two: preliminary drill, and practice.

Q. What is comprised under the head of preliminary drill?

A. Cleaning arms, theoretical principles, aiming drill, position drill (snapping caps and blank firing, for recruits *only), judging distance* drill, making cartridges.

Q. What is comprised under the head of practice?

A. Firing singly, firing by files, firing in volleys, firing in skirmishing order, judging distance practice, and firing without using the back sight.

Preliminary Drill.

Q. What is kept in each company to record the drill a soldier has to go through before he can be allowed to fire ball cartridge?

A. A Preliminary Index.

Q. How many headings are in this index?

A. Six.

Q. What is the first heading?

A. Cleaning of arms.

Q. What is comprised under the head "Cleaning of arms?"

A. Lock instruction, cleaning the rifle, and keeping it in proper order.

Q. In how many lessons is this most important part of the soldier's drill to be taught?

A. Eight.

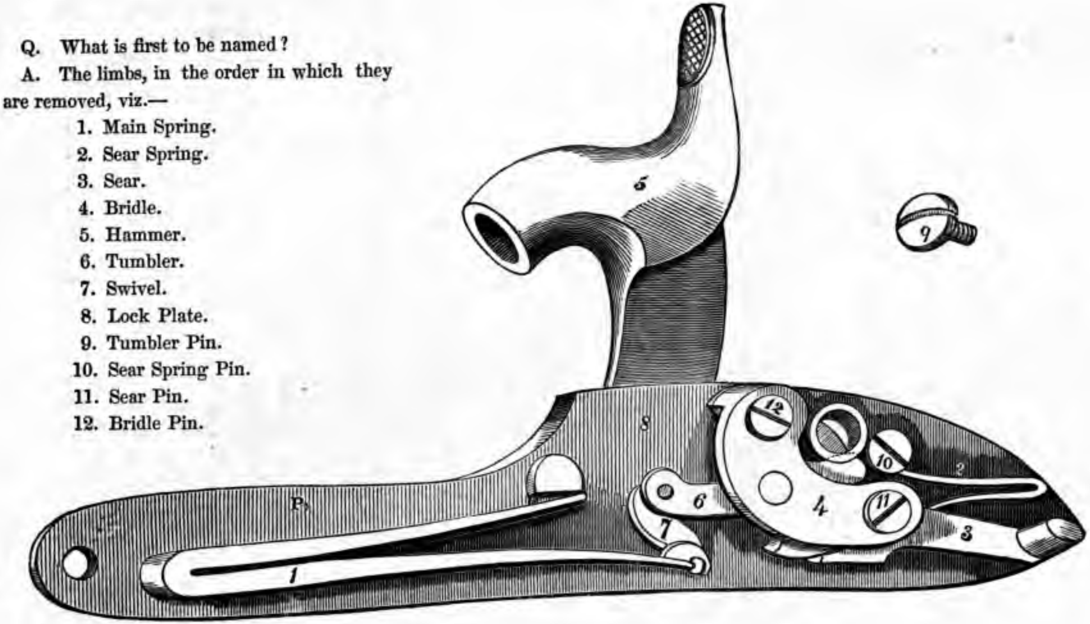
Q. What is the first lesson?

A. Name the limbs of the lock, and the other principal parts of the rifle; as also, explain how to dismount the ock.

Q. What is first to be named?

A. The limbs, in the order in which they are removed, viz.—

1. Main Spring.
2. Sear Spring.
3. Sear.
4. Bridle.
5. Hammer.
6. Tumbler.
7. Swivel.
8. Lock Plate.
9. Tumbler Pin.
10. Sear Spring Pin.
11. Sear Pin.
12. Bridle Pin.



Q. What are the principal parts of the rifle
A.

STOCK.

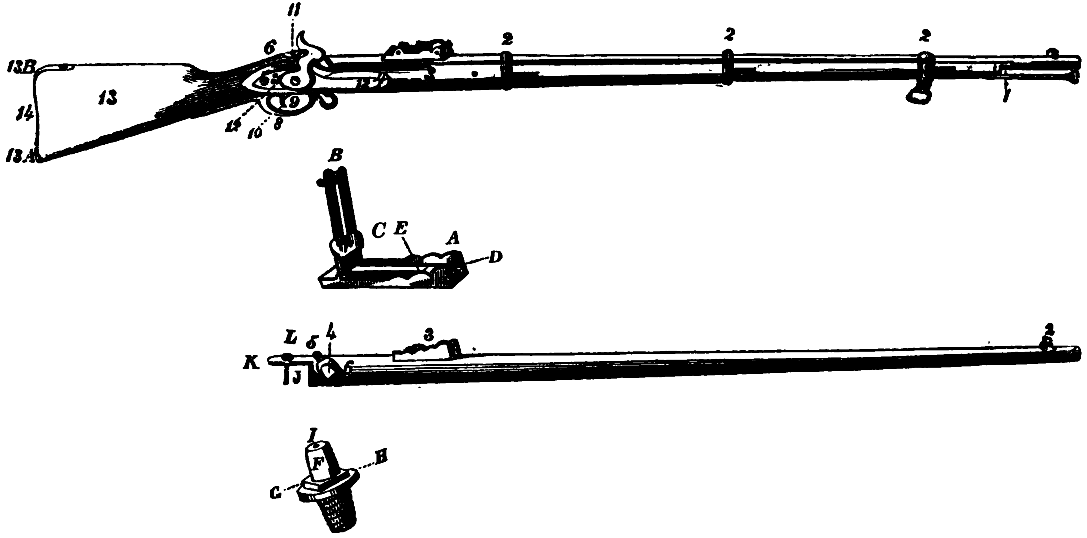
1. Nose Cap.
2, 2, 2. Bands.
    - Upper.
    - Middle.
    - Lower.
3. Swell.
4. Projections.
5. Lock Side.
6. Head.
7. Small.
8. Trigger-guard.
9. Trigger-plate.
10. Trigger.
11. Breech-nail.
12. Side-nails.
13. Butt.
    - Toe A.
    - Heel B.
14. Heel-plate.

BARREL.

1. Muzzle.
2. Fore Sight.
3. Back or Elevating Sight.
    - Flanges A.
    - Flap B.
    - Slider C.
    - Spring D.
    - Bed E.
4. Nipple Lump.
5. Nipple.
    - Cone F.
    - Square G.
    - Shoulder H.
    - Touch-hole I.
6. Breech.

Breechpin.
- Face J.
- Tang K.
- Breech Nail-hole. L.

The Rifle.



Q. How is the lock to be dismounted?

A. Unscrew and remove tumbler pin, put the lock at full cock, then place the cramp on mainspring, and after letting the hammer down, remove it. Partly unscrew sear-spring pin; then place the edge of the turnscrew between the bend of sear spring and lock plate, to raise the former from the latter, after which unscrew sear-spring pin and remove sear. Unscrew the sear pin and remove the sear, unscrew the bridle pin and remove bridle. Remove the hammer (which is to rest in the hollow of the hand) by a few smart taps as near the lock plate as possible. Remove tumbler. Remove swivel from tumbler.

Q. What is the second lesson?

A. Name the various parts of the limbs of the lock.

1st. MAINSPRING.

1. Catch. 2. Return. 3. Stud. 4. Bend. 5. Spring. 6. Claws.

2nd. SEAR SPRING.

1. Eye. 2. Return. 3. Stud. 4 Bend. 5. Spring. 6. Toe.

3rd. SEAR.

1. Arm. 2. Body. 3. Eye. 4. Neck. 5. Nose.

4th. BRIDLE.

1. Stud. 2. Foot. 3. Bridle pin hole. 4. Tumbler pivot hole. 5. Sear pin hole.

5th. HAMMER.

1. Mouth. 2. Head. 3. Comb. 4. Neck. 5. Body. 6. Hole for square of Tumbler.

6th. TUMBLER.

1. Pivot. 2. Bearer. 3. Shaft. 4. Swivel pivot holes. 5. Halt bent. 6. Full bent. 7. Axle. 8. Squares. 9. Tumbler pin hole.

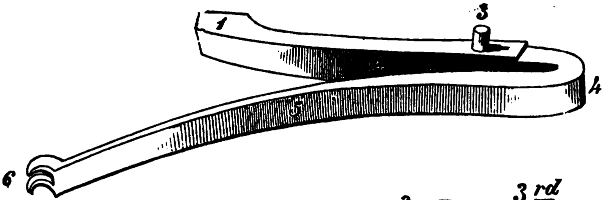
7th. SWIVEL.

1. Body. 2. Pivots.

8th. LOCK-PLATE.

1. Front side nail hole. 2. Mainspring stud hole. 3. Fore stud. 4. Bridle stud hole. 5. Bridle pin hole. 6. Hind stud. 7. Hind side nail hole. 8. Sear spring pin hole. 9. Sear spring stud hole. 10. Sear pin hole. 11. Tumbler axle hole.

1st



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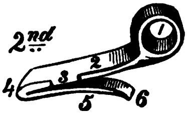

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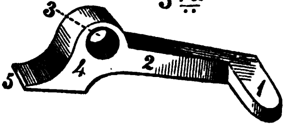

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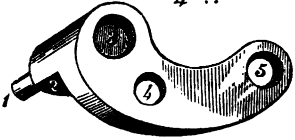

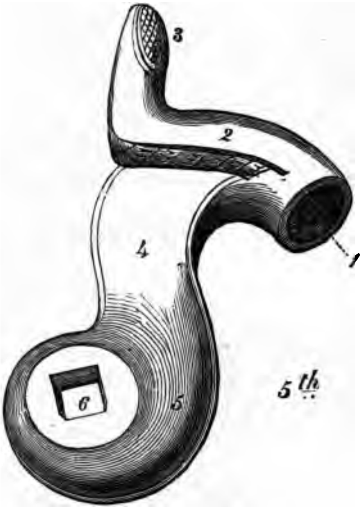

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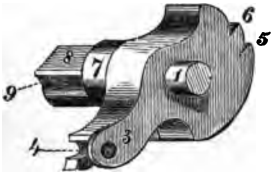

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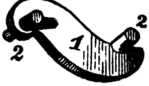

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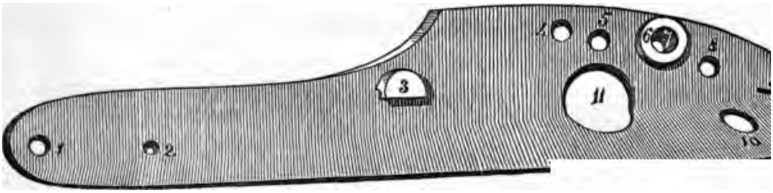


Q. What is the third lesson?

A. Instructions to clean the lock and rifle, and keep them in proper order.

Q. How are you to clean the several limbs of your lock?

A. Wipe them with an oiled rag, and afterwards with a dry one.

Q. What part of the lock plate are you more particularly to keep free from rust?

A. The tumbler axle hole.

Q. How are spots of rust to be removed?

A. With an oiled rag.

Q. Why not with brick-dust or sand-paper?

A. Because it would remove the case hardening and render the several parts which are not steel more liable to rust.

Q. What is case hardening?

A. A thin coating of steel over the iron.

Q. How are locks case-hardened?

A. By inserting them in a sheet-iron case in the midst of bone dust, the lid being secured with iron wire, and the joints luted with clay. It is left in a furnace of red heat, and then the locks are suddenly dipped in cold water.

Q. What are the parts of the lock to which it is actually necessary to apply oil?

A. The frictional parts.

Q. What are the frictional parts?

A. The nose of the sear, the toe of the sear-spring, the pivot and axle of tumbler, pivots of swivel.

Q. What kind of oil is to be used?

A. Animal and not vegetable.

Q. How applied?

A. With a pin or pricker.

Q. Before you commence washing out your rifle, what are you to do?

A. Place the lock at full cock, and then place a piece of woollen rag or tow in the jag of rod and twist it round so as to cover the head.

Q. How are you to hold the rifle?

A. In the left hand, at the full extent of the left arm, barrel downwards, with forefinger and thumb in line with, and round muzzle, the heel of the butt resting on the ground to the rear.

Q. How much water at a time are you to pour into the barrel?

A. About a quarter of a pint.

Q. What are you to be careful to prevent?

A. Any water running down between stock and barrel, or entering the lock plate through the tumbler axle hole.

Q. How is the dirt or fouling to be removed?

A. By carefully moving the rod up and down the barrel, forcing the water through the nipple to clear the touch hole.

Q. How are you to dry the bore of the rifle?

A. By wiping it thoroughly out with dry rag or tow.

Q. What are you to be careful not to forget after cleaning rifle?

A. To put the snap cap on the nipple, and stopper in muzzle, letting the hammer down on the snap cap; mouth of snap cap and hammer to be kept perfectly clean and dry.

Q. How is the fouling which settles about the breech and nipple lump to be removed?

A. Without using water, damp rag, knife or sharp instrument.

Q. When is the bore of the rifle to be again wiped *perfectly* clean and dry?

A. On the following morning, and on every occasion to be freed from oil before using the rifle.

Q. By the foregoing mode of cleaning, what will be prevented?

A. The barrel becoming rusty, and the frequent necessity of removing it from the stock.

Q. What is it advisable to do to prevent water soaking into the stock?

A. Rub it over with oil and bees'-wax, smearing a little between it and barrel, and between the lock plate and stock.

Q. What is the greatest enemy we have to contend with in the use of a rifle by soldiers?

A. Dirt; and its delicate sensibility to this its weak point.

Q. What is the fourth lesson?

A. Remount the lock.

Q. What is the first limb you mount?

A. The swivel, which you attach to the tumbler.

Q. The second?

A. The tumbler—placing it in the tumbler axle hole with bearer against hind stud of lock plate.

Q. The third?

A. The bridle on pivot of tumbler—placing its stud in lock plate, then screw home bridle-pin.

Q. The fourth?

A. The sear—placing it between the bridle and lock plate, with nose against tumbler, and screw home sear pin.

Q. The fifth?

A. The sear spring, which partly screw to lock plate, then with flat part of left thumb, press it until the stud enters stud hole, and screw home sear spring pin.

Q. The sixth?

A. The hammer—which place on squares of tumbler, as if on nipple, and screw home tumbler pin.

Q. The seventh?

A. Mainspring—attaching its claws to swivel, then place its stud in lock plate with catch against fore stud, raise the hammer to full-cock and remove cramp, then ease lock to half-cock.

Q. What is the fifth lesson?

A. Explain the uses of the different parts of the lock, in two lessons.

Q. What office does the mainspring perform?

A. It draws the hammer down on the nipple to explode the cap.

Q. How is the action of the spring ensured?

A. By the return of the spring being firmly fixed by its stud entering the mainspring stud hole, and its catch bearing against the fore stud of lock plate.

Q. What is the use of the sear spring?

A. It acts upon the body of the sear, pressing it down, thereby causing the nose of the sear to enter the bents when the tumbler revolves.

Q. How is the action of this spring ensured?

A. Precisely in same manner as action of mainspring.

Q. How does the sear act?

A. As a break or stop on the tumbler, keeping the lock at half or full-cock.

Q. How should the nose of the sear be constructed?

A. So as to fit the bents exactly.

Q. On what part of the sear does the blade of trigger act?

A. On the arm, which, when the trigger is pressed back, is levered up—raising the nose of the sear out of the full bent, and thereby releasing the tumbler to the action of the mainspring.

Q. What is the pull of the lock without trigger?

A. 13lbs. to 14lbs.

Q. What with trigger?

A. 7lbs. to 8lbs.

Q. Why does the trigger make the pull easier?

A. Because, when the trigger is pressed back, the blade of it is raised, and acts as a lever, prising up the arm of sear.

Q. What is the sixth lesson?

A. Explain the uses of the bridle, hammer, tumbler, and lock plate.

Q. What is the use of the bridle?

A. It secures the tumbler and sear in their proper places.

Q. How is it kept in its place?

A. By its stud entering the stud hole and the sear and bridle pins securing it to the lock plate.

Q. What is the use of the hammer?

A. To explode the cap.

Q. Which is the most important limb of the lock?

A. The tumbler.

Q. How does it act?

A. It holds the hammer and revolves in the lock plate and bridle.

Q. Does it require to be made strong?

A. Yes: to sustain the force of the mainspring.

Q. What are the notches in it termed?

A. Bents, half and full.

Q. What are they for?

A. The half-bent for half-cock, to enable you to cap; the full-bent for full-cock, when you wish to fire the rifle.

Q. What is the construction of the half-bent?

A. It has two angles, one acute and the other obtuse.

Q. Why is such a formation necessary?

A. To prevent the possibility of the sear nose being released by the action of the trigger.

Q. How must the full-bent be formed?

A. So as to allow the sear nose to be withdrawn from it with the least possible resistance.

Q. If the edge of the point of the half-bent protrudes beyond that of the full-bent, what would be the consequence?

A. The sear nose, when released from the full-bent, would catch at the half-bent, and not allow the hammer to fall on the cap.

Q. What is necessary to ensure the proper action of the tumbler?

A. That the full and half-bents are in the same arc of a circle.

Q. What would be the result if you were to open out or file away the half-bent?

A. The lock would go off at half-cock.

Q. How does the shaft of the tumbler act?

A. Being connected by the swivel to the mainspring, when the hammer is drawn back, it lifts or levers it up.

Q. What is the use of the lock plate?

A. It is the foundation of the lock, to which the several limbs, pins, and studs, are secured.

Q. What is the use of the fore stud?

A. To secure the catch of the mainspring.

Q. The hind stud?

A. It acts as a break on the tumbler, prevents it revolving farther than is necessary when put in motion by the mainspring, the action of which it suddenly stops.

Q. What is the seventh lesson?

A. Explain how the rifle and ammunition may get out of order, and how prevented, in two lessons.

Q. What is absolutely necessary to ensure a true and easy action of the lock?

A. That the several pins, pivots, &c., are perpendicular to the lock plate, which must be a perfect plane.

Q. Would loosening the sear, or any other pin, ensure an easier pull off?

A. No: it would impair the lock, by causing increased friction to the several limbs thrown out of their place.

Q. What is the cause of too hard a pull off?

A. Either the full-bent and sear nose are not well adapted to each other, or the sear spring is too strong.

Q. What are the bad results of too strong a pull off?

A. Derangement of aim when firing.

Q. By whom is the pull to be altered?

A. The armourer, and never attempted by the soldier.

Q. When is a lock said to be wood-bound?

A. When the parts are embedded in the wood-work of the stock, and thereby prevented from exercising their proper functions.

Q. What would cause the lock to become wood-bound?

A. The swelling of the wood in damp weather; water soaking into the stock; screwing the lock too tightly to the stock.

Q. How many causes of miss-fires may be attributed to the rifle?

A. Four: weakness of mainspring; communication hole too small; nipple screw too long; nipple too large for percussion cap.

Q. How many to the soldier?

A. Three: dirty or rusty state of tumbler axle hole; percussion cap not pressed firmly home on nipple; accumulation of dirt at the base of touch hole.

Q. What is the eighth lesson ?

A. A continuation of the seventh lesson.

Q. What results from want of care in preserving the barrel from receiving any bend or dents ?

A. Inaccurate shooting.

Q. Why are soldiers on no account to use their rifles for carrying weights ?

A. Because the barrels being made of soft metal, they are easily bent.

Q. In what other ways are soldiers very likely to injure their rifles ?

A. Placing them carelessly in arm racks; letting them fall, which will bend the barrel, more particularly at the muzzle where the metal is the thinnest, and thus rendering the arm irreparably damaged.

Q. What part of the rifle is it very necessary to protect from injury ?

A. The fore-sight, which, if battered or rubbed away, would cause the rifle to carry high.

Q. If the bore of the rifle is allowed to become rusty, what effect will it have on the bullet ?

A. Increased friction to the passage of the bullet whilst passing up the barrel, causing it to strip (or pass out of the groves); prevent its proper expansion, and impair its rotatory motion, which is essential to produce accurate shooting; it will also render the rifle difficult to load.

Q. A soldier who cannot prevent this by keeping his barrel clean is considered what ?

A. Unfit to be entrusted with a rifle.

Q. What is rust caused by ?

A. The joint effect of moisture and air.

Q. What is the best way of preventing the barrel from becoming rusty ?

A. By keeping the bore perfectly dry, placing the stopper in muzzle and snap cap on nipple.

Q. What would render the rifle liable to burst ?

A. The muzzle being run into the ground and becoming stopped up with dirt or clay.

Q. What are soldiers to be taught as regards the preservation of their ammunition ?

A. To keep the inside of their pouches clean, so that no dust or dirt may adhere to the greased part of the cartridge.

Q. How is the possibility of loose cartridges becoming damaged to be prevented ?

A. By carefully folding them in paper that they may not shake about in the pouch.

Q. Why are soldiers particularly cautioned to keep their cartridges and percussion caps dry ?

A. Because damp powder will not drive a bullet so far as dry powder, and is more difficult to ignite.

Q. When the soldier is on picquet, or when his rifle is likely to be exposed to rain, what ought he to do to ensure its not missing fire ?

A. Remove the percussion cap and place the snap cap on the nipple. In the event of his not having a snap cap, he is to stop up the nipple with grease or wax, easing the spring in either case ;—if he cannot procure grease or wax, plug the nipple up with a peg of soft wood.

Q. Will either of these methods prevent the explosion of the powder ?

A. Neither the grease nor peg will in any way impede the action of the percussion cap if properly pressed home.

Q. Why are non-commissioned officers and privates not allowed to remove their rifle barrel from the stock ?

A. Because it requires great care in removing them to prevent the head of the stock being broken.

Theoretical Principles.

Q. What do theoretical principles teach the soldier?

A. They teach him the reason for all those rules which have to be attended to in practice.

Q. Is it necessary to show the soldier that the upper surface of the barrel does not lie in the same direction as the inside, or bore?

A. Yes: with a view to prove that the barrel has some elevation in itself.

Q. What is the axis of the rifle barrel?

A. An imaginary line along the centre of the bore of the rifle.

Q. What does it show?

A. The course taken by the centre of the bullet during its passage along the barrel. Secondly, the distance and direction in which it is guided in its flight, viz., three feet three inches.

Q. What is the line of fire?

A. The direction in which the bullet would fly, and with equal velocity for ever and ever, were it not impeded by the resistance of the atmosphere, and drawn from it by the force of gravity.

Q. What is the atmosphere?

A. An elastic fluid through which the bullet cannot work its way without experiencing some degree of reactionary force, and thus reducing at every moment its velocity.

Q. Does the amount of resistance of the atmosphere depend upon the speed with which the bullet is travelling?

A. Yes: the greater the speed, the greater will be the resistance of the atmosphere.

Q. What is gravity?

A. A power by which all bodies heavier than the air are drawn towards the centre of the earth.

Q. Does it commence to act upon the bullet as soon as it quits the muzzle?

A. Yes: and draws it towards the ground with greater velocity in proportion to the time it is exposed to its influence.

Q. How do these two distinct *motions* cause the bullet to move after leaving the barrel?

A. The one increasing as the other diminishes, cause the bullet to move in a curved line called the "trajectory."

Q. If the axis of the piece is directed on an object, will the bullet hit it?

A. No: the bullet will pass below it.

Q. How much does the bullet fall in 100 yards?

A. About one foot five inches.

Q. What must be done to enable you to strike the mark?

A. Direct the line of fire on a point as much above the mark as the bullet was found to strike below it, viz., one foot five inches.

Q. Does the trajectory conform itself to the line of fire?

A. Yes: the course the bullet takes is below the line of fire, except when the wind blows the bullet to the right or to the left.

Q. What is necessary to fire with accuracy?

A. That the sights should be carefully aligned between the eye and the mark.

Q. If the line of sight was parallel to the axis, what would it be necessary to do?

A. At 100 yards distance, to aim one foot five inches above the mark.

Q. What would be the result of this?

A. There would be no certainty as to the correct elevation, and the firer would lose sight of the mark.

Q. How is this obviated?

A. By fixing a back sight on the breech of the rifle barrel.

Q. How does this sight enable you to be certain of the correct elevation?

A. It raises the eye above the breech of the rifle, and when the top of the fore sight is brought into the alignment with the bottom of the back notch, the axis of the piece receives the necessary degree of elevation.

Q. What is a soldier particularly to attend to when he brings his rifle to the present?

A. That the sights are not inclined either to one side or the other.

Q. How are the bad results of not attending to this rule plainly shown?

A. By drawing a vertical line on a board or door, and directing the soldier to place the barrel of a rifle (breech removed) on a traversing rest, and then take aim at a spot thereon with the 900 yards sight perfectly upright.

Q. What do you next direct him to do?

A. Look through the hole in the centre of the plug placed in the barrel, and observe where the cross wires of the cap placed on the muzzle cut the vertical line.

Q. How do you show the loss of elevation and direction caused by an inclination of the back sight either to the right or left?

A. By directing the soldier to aim at the same spot with the 900 yards sight inclined to the right or left.

Q. What will you next direct him to do?

A. To look through the barrel again, when he will see the line of fire directed to that side to which he has inclined the sight, and also that it is much lower than in the former instance.

Q. Will this cause him to miss the mark?

A. Yes, as the trajectory conforms itself to the line of fire, consequently the bullet will strike low on that side to which the sight has been inclined.

Q. What is wind?

A. The air set in motion.

Q. When firing at a mark, is it necessary to observe the direction of the wind?

A. Yes, if the wind is blowing across the range, you must aim towards that side from which the wind is blowing, closely watching each shot to ascertain what allowance you have to make.

Q. Will the bullet be as much affected by a front or rear wind?

A. No, it will only decrease or increase the speed of the bullet.

Q. Is the soldier's aim likely to be affected by the bright spots on the sights of the rifle on a sunny day?

A. Yes, his eye will more readily catch those bright spots instead of the real centre of the notches.

Q. How will this affect his shooting?

A. If the sun is shining from the right, he will be very liable to shoot to the left, and if from the left to the right.

Q. Why?

A. Because the sun will light up the left side of back notch and right side of fore sight, and when these spots are aligned between his eye and the mark, the axis will be directed to the left, and *vice versâ.*

Q. If the sights of the rifle are not placed on the centre of the barrel, will it cause you to miss the mark?

A. Yes, if your back sight is placed to the right of the barrel, your rifle will carry to the right, and *vice versâ.*

Q. Why?

A. Because the axis will be directed to that side to which the back sight is placed.

Q. If the fore sight is placed on the left of the barrel, to which side will the rifle carry?

A. To the right.

Q. Why?

A. Because the axis will be directed to the right.

Q. How is this defect remedied?

A. By aiming in the contrary direction.

Q. How are you to aim at an object moving across you?

A. Always in front of it according to the speed at which it is travelling.

Q. How must you aim at an object if you find you have not a full charge of powder?

A. A little high, otherwise the bullet will fall short of the mark.

Q. What were the chief causes of uncertain firing with the old musket?

A. Excess of windage and defective figure of bullet.

Q. What do you understand by windage?

A. The difference of size between the bore and the bullet.

Q. Why was so large an amount of windage necessary?

A. Because, if the bullet had been the same size as the bore, when the barrel became foul the bullet would not enter it.

Q. How has the error due to excess of windage been rectified?

A. By an elongated expanding bullet.

Q. How is the bullet expanded and made to fit the barrel tightly?

A. By the pressure of the air in front, and the force of the explosion on the wooden plug or cup in base of bullet.

Q. Was good firing attained with this bullet?

A. No, if anything, worse.

Q. How then are we enabled to make such good practice up to 900 yards?

A. By rifling the barrel.

Q. What do you understand by rifling the barrel?

A. The cutting of any number of spiral grooves down the bore of the gun.

Q. What is the effect of these grooves?

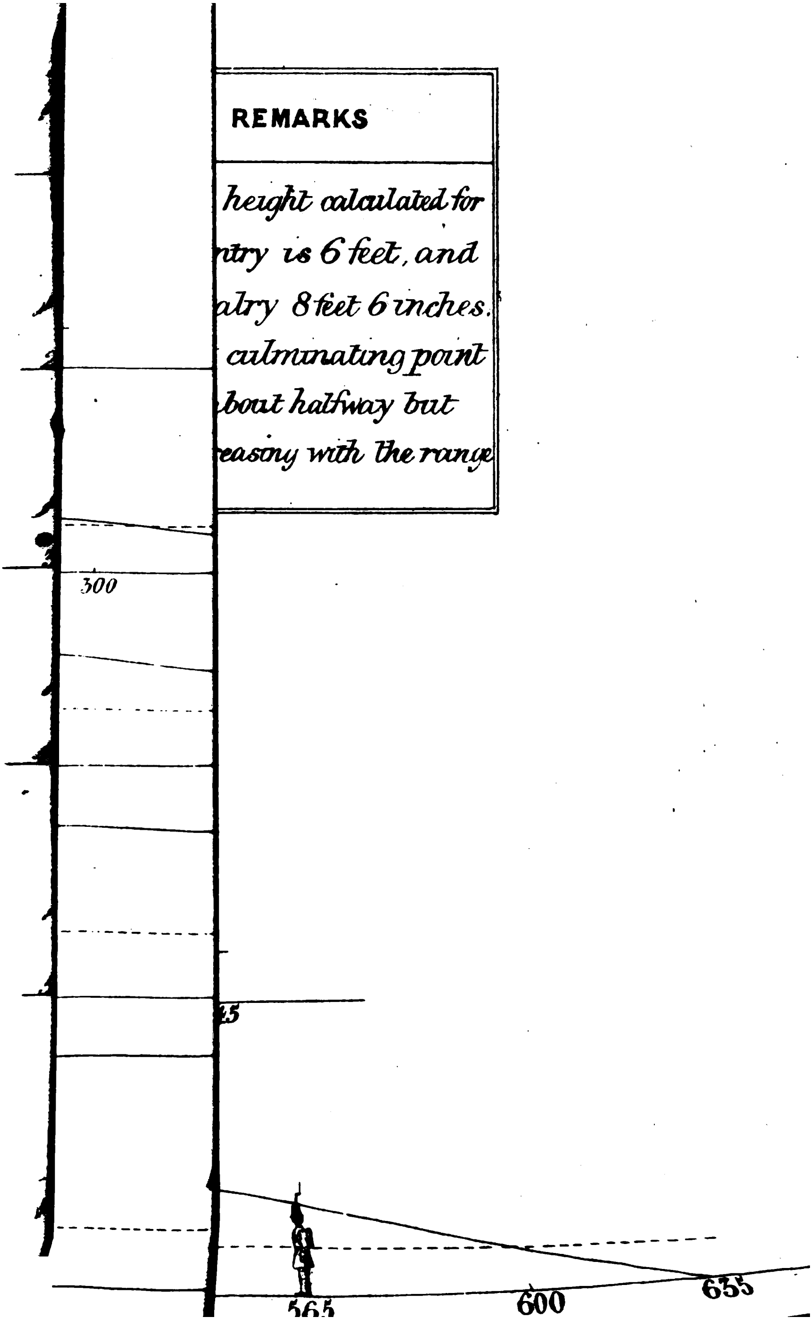
A. They cause the bullet to turn or spin on its longer axis.

Q. How has the error due to a bullet of defective figure been in a great measure rectified?

A. By rifling the barrel, which causes it to strike much nearer to the mark than it otherwise would do.

REMARKS

height calculated for
ntry is 6 feet, and
alry 8 feet 6 inches.
culminating point
bout halfway but
easing with the range



Aiming Drill.

Q. What does aiming drill teach the soldier?

A. To take an accurate aim, and to adjust the back sight of the rifle.

Q. How is his progress tested?

A. By making him aim at different distances, laying his rifle on a sand bag, placed on a tripod.

Q. How many men is each squad to consist of?

A. Never more than ten, formed in single rank at each rest.

Q. After he has laid his rifle on the sand bag, what is he particularly to be cautioned?

A. Not to allow his sight to incline either to the right or the left.

Q. How is the line of sight to be taken?

A. Along the bottom of the centre of the back notch of the back sight, and the top of the fore sight.

Q. How is the soldier to commence taking his aim at each distance?

A. By first setting the back notch on the bull's eye, and then raising the muzzle until the top of the fore sight is brought into the alignment: the left eye to be closed.

Q. How many kinds of sights are there?

A. Three: a fine, a full, and a half sight.

Q. What is a fine sight?

A. When the line of sight is taken along the bottom of the notch of the back sight, and the top of the fore sight.

Q. What is a full sight?

A. When the point of the fore sight is taken in alignment with the shoulder of the notch of the back sight.

Q. What is a half sight?

A. When the point of the fore sight is aligned midway between the shoulder and bottom of the back sight.

Q. If the instructor finds the soldier has not taken a correct aim, what is he to do?

A. Call out the next man, who is to look along the sights and state the defects.

Q. Who will correct the aim?

A. The man who first laid the rifle.

Q. At what distance will the soldier aim?

A. At every fifty yards, from 150 to 900.

Q. At what sized bull's-eye will he aim up to 300 yards?

A. Eight inches in diameter.

Q. At what size from 350 to 900 yards?

A. Two feet in diameter.

Q. What are the good results attending this most important part of the soldier's training?

A. It strengthens his eye by looking at smaller objects than he fires at when practising.

Position Drill.

Q. What motions is the soldier put through in position drill?

A. All the motions of firing, standing and kneeling, with the same accurac as if actually firing, *close attention* being paid to each movement.

Q. What does position drill teach the soldier?

A. It habituates him to the correct position, and teaches him the natural connection which should exist between the HAND and the EYE, to enable him to press the trigger at the proper moment.

Q. In what does position drill differ from platoon drill?

A. The latter comprehends the positions of loading and firing in the ranks; whereas the former, the essentials of *good independent practice.*

Q. In what order is position drill always to be executed?

A. In marching order, with fixed bayonets when standing, and unfixed bayonets when kneeling.

Q. How many men is each squad to consist of ?

A. Not more than ten, formed in single rank, at one pace apart.

Q. Why not more than ten ?

A. Because it is impossible for an instructor to watch attentively more than that number.

Q. Is it possible to give a man too much position drill ?

A. Not if well executed.

Q. What is to be the duration of each drill ?

A. Not longer than half an hour.

Q. What is the first duty of instructor ?

A. To point out to each man a small object to aim at.

Q. For this purpose what are to be painted on the barrack walls ?

A. Bull's-eyes (white) of the size of a crown, with a black centre the size of a shilling.

Q. How many practices are there in position drill?

A. Three: first, second, and third practice.

Q. What are the words of command in the first practice ?

A. "*Position drill, first practice, as a ——— rank, at —— yards. Ready.*"

Q. What are the men to be particularly cautioned about ?

A. To hold the rifle firmly with the left hand, behind the lower band and not nearer the nipple than the projection; that the fingers of the right hand are behind the trigger guard; that the body is erect, left side perpendicular, left breast over left foot, shoulders at the half face, and feet at right angles; and that the eyes are fixed on the mark in front, with head in the same direction, and erect. When kneeling, the right foot and knee are to be in the proper position, and the body resting firmly on right heel.

Q. What words of command are next given?

A. "*Present.* —— *Two.* —— *Three.* —— *Ease springs. Order arms.* —— *Stand at ease.*"

Q. What explanations are given at the present?

A. Without moving the body, head, eye, or hand, in the slightest degree, throw the rifle smartly to the front of the right shoulder at full extent of left arm (arms moving close to the body), raising the rifle, muzzle a little low and sights upright; top of heel plate in line with top of shoulder; muzzle a few inches below the mark the eyes are fixed upon; forefinger along the outside of trigger guard, both elbows inclined downwards.

Q. What explanations are given at the command "Two"?

A. Bring the rifle smartly to hollow of right shoulder, pressing it in with the left hand, at the same instant bring the left elbow well under rifle, and right elbow nearly square with right shoulder, and inclined to the front to form a bed for butt; but without moving the body, head, hand, or eye, still keeping fore finger outside trigger guard.

Q. What explanation is given at the command "Three"?

A. Bring the rifle smartly down to the capping position close in to the body, without altering the position of body, head, hand, or eye, placing forefinger behind trigger guard.

Q. After the men are thoroughly grounded in foregoing positions, are they to be exercised in first practice, judging their own time ?

A. Yes, the words of command being, after coming to the ready, "*First practice, judging your own time.* —— *Present.* —— *Steady.* —— *Ease Springs.* —— *Order arms.* —— *Stand at ease.*"

Q. What are the good results attending the foregoing practice ?

A. It accustoms the soldier to handle his rifle expertly, and by *strengthening* the *left arm* gives him a perfect command of it; it also habituates him to raise it to the shoulder, horizontally, WITHOUT MOVING HIS BODY.

Q. What are the words of command in second practice?

A. "*Position drill, second practice, as a* ——— *rank, at* —— *yards. Ready.*"

Present.	Combine first and second motions of first practice, and look at the object through the bottom of notch of back sight.
Two.	Place forefinger round trigger, that part between first and SECOND joints RESTING FLAT on the trigger, and RESTRAIN THE BREATHING.
Three.	Raise the muzzle until the top of fore sight is brought in a line with the object through the bottom of the notch of back sight.
Four.	Squeeze the trigger, without least jerk or motion of hand, eye, or arm, still keeping the eye firmly fixed on the object.
Five.	Bring the rifle to the capping position

and "full cock"; repeating the practice several times.

Ease springs—order arms—stand at ease.

Q. What are the words of command in third practice?

A. "*Position drill, third practice, as a ——— rank standing. Load. At —— yards, as a ——— rank. Ready. ——— Independent practice from both flanks.*"

Commence. Each man will come to the present in order of file firing for the first time, and perform the motions regularly in his own time; afterwards, independently of his right or left hand man; immediately the butt touches the shoulder, the forefinger is placed round trigger, and, after snapping, come to the position of "prepare to load," from the capping position, and proceed to load standing.

Cease Firing. After each man has completed his loading he will order arms.

Q. What is to be particularly attended to in the foregoing practice?

A. That each man is in the correct position when at the present, that the barrel is not turned over to right or left, the heel plate is pressed firmly against the shoulder with left hand, the trigger pressed without the least motion of hand or arm, and that the eye is fixed upon the mark during and after snapping.

Q. Is the instructor to scrutinize each man in his squad during this drill?

A. Yes: pointing out and correcting the errors he may have discovered in any man's position and to see that his aim is not lost by pressing the trigger.

Q. What is the instructor to do when he observes a *man bringing his rifle* incorrectly to the "present?"

A. Cause him to come to the present three or four times without loading, to correct the defect noticed.

Snapping Caps.

Q. How many caps has a recruit to snap before he can be allowed to fire?

A. Twenty, viz.:

5 singly	Standing.
2 by files	
3 in volleys	
5 singly	Kneeling.
5 in volleys	

Blank Firing.

Q. Before the recruit is permitted to fire ball, how many rounds of blank cartridge is he to fire?

A. Twenty rounds, viz.:

5 singly	Standing.
2 by files	
3 in volleys	
5 singly	Kneeling.
5 in volleys	

Judging Distance Drill.

Q. What is the soldier taught in this drill?

A. To note the difference in the appearance of men at different distances.

Q. How do you instruct your company in judging distance drill?

A. By throwing out points at known distances, up to 300 yards, and making each man observe the appearance of the men.

Q. How do you throw out the points for knówn distances?

A. I place a man as a base point, either on the right or left of the company, I then march a man twenty paces in front of the base point, and cover these two points on some distant object, after which I place a third man ten paces to the right, or left, of the base point, then march a squad of six men, formed two deep, on the alignment chosen, and halt it at 50 yards distance, when No. 3 of the rear rank faces about, and covers the two men already aligned on the distant object. The squad is then to make a half-face, marching in an oblique direction, dropping a man at every $50\frac{5}{6}$ yards or 61 paces up to 300 yards, which men will cover diagonally on the point placed 10 paces to the right or left of base point.

Q. After you have aligned the points diagonally, what do you do with the covering points?

A. I order them to join their sections.

Q. What do you next do?

A. Place an instructor opposite the several "points for observation," who will direct the men to notice—

1st. The position of the sun.
2nd. The state of the atmosphere.
3rd. The back ground.
4th. The general appearance of objects looked at.

Q. What is the instructor, placed opposite the 300 yards point, particularly to point out to the men?

A. The difference of the appearance of the men placed at the six distances up to 300 or 600 yards, as the case may be.

Q. After the men have been made to observe these points, are they to be immediately drilled at unknown distances?

A. Yes, but on different ground.

Q. What constitutes a judging distance drill?

A. Making the squad or company observe the appearance of men placed at known distances, and then their judging the distance of men placed at unknown distances, each man giving three answers.

Q. How do you carry on judging distance drill at unknown distances?

A. I send a man out unobserved by the squad, but not beyond 300 yards; I then call out each man, separately, and order him to give his answer in a low tone of voice, which I note down in a register.

Q. Is every man to adjust the sight of his rifle for the distance he judges?

A. Yes.

Q. What is to be read over to the men?

A. The answers they have given.

Q. How will the distance be measured?

A. With a rope or chain. The instructor placing himself in the centre of the company, and counting the number of paces aloud, the men counting them to themselves, as they advance.

Q. How are the men to be taught to count the distance?

A By tens of paces—at every 120 paces, they will double up a finger, to mark 100 yards, and when the distance appears to be less than 100 yards, they will count by tens of yards, doubling up a finger at every twelve paces.

Q. When judging beyond 300 yards, how is the distance to be measured?

A. The party will be divided into subdivisions, facing each other, with a file thrown out on the flanks; after the answers have been given, and checked, the parties will advance towards each other, measuring the distance by pacing, and also with a rope.

Q. How are the points given when judging up to 300 yards?

A. Within five yards of the correct distance, three points; within ten yards, two, within fifteen yards, one.

Q. After the company has been drilled for two days at fixed and unknown points up to 300 yards, are they to be drilled in a similar manner up to 600 yards?

A. Yes: the third and fourth day.

Q. How are the fixed points thrown out when exercising up to 600 yards?

A. In the same manner as when exercising up to 300 yards; the points of observation being two men, placed at every fifty yards from 350 to 600 yards.

Q. How are they given when judging from 300 to 600 yards?

A. Within 20 yards, two points, within 30 yards one.

Q. How many men per company are to be practised annually in making cartridges?

A. Twelve at least.

Target Practice.

Q. What is the size of a single target?

A. Six feet in height, and two in breadth.

Q. How are the points given, firing up to 300 yards, and what flags are raised to denote the several hits?

A.	Outer	one	White flag.
	Centre	two	Blue flag.
	Bull's-eye	three	Red and white flag.
	Ricochet	R	Red flag waved in front of butt.

Q. How are they given beyond 300 yards?

A. Outer - - one - - White flag.
Centre - - two - - Blue flag.
Ricochet - R - - Red flag waved.

Q. What is the danger flag, and when is it to be raised?

A. A red flag, raised when the cease firing is sounded, and when the markers are out of their butt.

Q. How are the shots which strike the target to be signalled?

A. By raising the flag above the marking butt to that side to which the shot has struck; if the shot strikes high it should be raised as high as possible, and when low, just above the butt.

Q. How are the men's names to be entered in the Target Practice Register?

A. In the same order as they appear in the "Musketry Drill and Practice Return," and according to which they will stand in the ranks for firing.

Q. Who is to mark in the register the number of points obtained by each man?

A. The company instructor or non-commissioned officer acting in his stead.

Q. How are all entries to be made?

A. In ink, on the practice ground, and any alteration required must be made thus: ~~3~~ 2 R. G. C., the initials of the officer of the company being immediately attached.

Q. If this rule is not attended to what will be the consequence?

A. The points in the register will not be allowed to count.

Q. How is the squad always to load?

A. By word of command.

Q. When and how is the practice to commence?

A. When the danger flag has been lowered. The officer will then order the right hand man to take a pace to his front, come to the capping position, and fire; then come to the shoulder, and wait to see whether his shot has struck, after which he will proceed three paces, in rear of the point he previously occupied. In like manner every man of the front rank will fire in succession, after which the rear rank will commence in a similar manner from the right, and form in rear of the front rank.

Q. After the section has fired, what word of command is given?

A. Three paces to the front, march, load.

Q. Whenever the hits on the target become too numerous to distinguish the new ones, what is to be done?

A. The officer of the section, company instructor and marker, are to compare the register with the target, and then the target to be carefully coloured afresh.

Q. At the conclusion of the practice at each distance, what are the officer and company instructor to do?

A. Compare the register with the target, and divide the total points by the number of men, carrying the quotient to two places of decimals.

Q. By whom are the registers to be signed?

A. The marker at butt, non-commissioned officer who keeps the register, and the officer of the company.

Q. What is then torn off the register?

A. The duplicate total points, after having been initialed by the officer instructor.

Q. At the conclusion of the day's practice what is the company instructor to do?

A. Enter the total points gained by each man, in the "*Musketry Drill and* Practice Return."

Q. At how many distances are the men to fire in one day?

A. Never more than two, viz: ten rounds individually.

Q. If a man fires one or more distances in a period and then becomes a casual, is he to be considered as having finished such period?

A. Yes: and classified accordingly.

Q. Should a man, after having fired one or more rounds at a distance, become a casual, is he to be considered as not having fired at the said distance?

A. Yes.

Q. How many rounds of ball ammunition are to be expended by every drilled soldier annually?

A. Ninety rounds, viz.—

60 in individual firing.
10 by files.
10 in volleys.
10 in skirmishing order.

Q. From what, and to what distances is he to fire?

A. Third class, 150, 200, 250, 300.
Second class, 400, 500, 550, 600.
First class, 650, 700, 800, 900.

Q. How many rounds is he to expend at each distance?

A. Five rounds.

Q. At how many targets does he fire from 150 to 300 yards?

A. Two, with a bull's-eye eight inches in diameter, and a centre two feet.

Q. How are the points given in this period?

A. Outer one, centre two, bull's-eye three.

Q. In what order are the men to fire?

A. In marching order, and always standing, up to 300 yards, beyond that distance kneeling.

Q. Into how many periods is the individual firing divided?

A. Into three, viz: first, second, and third, twenty rounds being expended in each period.

Q. At the conclusion of each period are the men to be classified?

A. Yes.

Q. How many points entitles a man to second class?

A. Fifteen.

Q. How many to first class?

A. Twelve.

Q. What is to be read over to the men on parade by the officer commanding the company, before commencing a new period?

A. The names of men who have passed into second class.

Q. How are the points given in second period, second and first class?

A. Outer one, centre, two.

Q. At how many targets does the second class fire?

A. Four, having a centre all black, two feet in diameter.

Q. How many targets are allowed to the first class?

A. Six, with a centre three feet in diameter.

Q. At the conclusion of the third period what is to be made out by the company instructor?

A. A classification table shewing the points obtained by each man, in the three periods, which is to be posted up in the barrack rooms.

Q. What are all men who have obtained seven points and upwards, exempted from?

A. Aiming drill under 600 yards in the succeeding annual course.

Q. At how many yards are the men to fire their ten rounds in file firing?

A. Three hundred yards.

Q. At how many targets do they fire?

A. Eight, each having a separate bulls-eye and centre.

Q. What value have the hits in this practice?

A. The same as in third class.

Q. What is to be the strength of each squad or section in this exercise?

A. Not more than ten files.

Q. At how many yards are the men to fire their ten rounds in volley firing?

A. At 400, both ranks kneeling.

Q. How are the hits to be counted?

A. As in practice of second class, bull's-eyes being reckoned only as centres.

Q. How are the ten rounds to be expended in skirmishing order?

A. Advancing and retiring between 400 and 200 yards, each file having its own target, with an interval of six paces between them.

Q. How are the targets to be painted?

A. As in the practice of third class.

Q. How are the hits to be counted?

A. As in volley firing, bull's-eyes being only valued as centres.

Q. At the conclusion of this practice as well as by files and volleys, what takes place?

A. The company instructor, and a non-commissioned officer of another company go up to the targets and mark off the hits in a diagram.

Q. Who signs this diagram?

A. The captain, or officer, of the company, who is to witness both the practice, and the examination of the targets.

Judging Distance Practice.

Q. How is the judging distance practice to be carried on?

A. In the absence of an instrument, a cord of the length required, labelled at every five yards from 100 to 900 yards, is to be laid down.

Q. How many men are placed on the cord, as points, when judging up to 300 yards?

A. One or more, but beyond that distance not less than ten files.

Q. What is kept to record the answer of each man?

A. A Judging Distance Register, by a serjeant or corporal under the superintendence of an officer.

Q. Who are first to give their answers?

A. The non-commissioned officers in charge of sections.

Q. Where are they to place themselves?

A. Three paces in front of the right of their sections, calling out each man, whom they caution to give his answer in a low tone of voice, which they immediately note down in the register.

Q. When the answers of every man have been taken, what is done?

A. The several answers are read aloud to the men, and the commander states aloud the correct distance, which is written at the top of the column, and the points obtained by each man, at the side of his answer.

Q. How many answers count for a practice?

A. Six.

Q. At the conclusion of each practice what is done with the register?

A. It is totalled and averaged, signed by the non-commissioned officer who kept it, and countersigned by the officer; the duplicate total points is to be initialed and torn *off by the officer* instructor.

Q. Into how many periods is judging distance practice divided?

A. Into three, viz: up to 300 yards, first period; up to 600 yards, second period; up to 900 yards, third period.

Q. How many practices are there in each period?

A. Two, or twelve answers.

Q. How are the points given in the first period?

A. Within five yards, three points: within ten yards, two points; and within fifteen yards, one point.

Q. How in the second period, second class?

A. Within twenty yards, two; within thirty yards, one point.

Q. How in the third period, first class?

A. Within thirty yards, two points; within forty yards, one point.

Q. How many points entitle a man to second class?

A. Fourteen.

Q. How many in second class to first class?

A. Fourteen.

Q. At the conclusion of the third period what is made out by the company instructor?

A. A classification table shewing the points gained by each man, and the class to which he belongs.

Q. Who is to be noted down, as the best judge of distance?

A. The man who has obtained the most points in the practice of the first class.

Company Returns.

Q. What is the "Musketry Drill and Practice Return" of the company to contain?

A. The name of every man borne on the strength of the company, without reference to where he is, or how employed, except the regimental staff serjeants and drummers, and recruits in a musketry sense.

Q. How are they to be entered?

A. By squads or sections, the non-commissioned officers being inserted at the head of their respective sections.

Q. What is to be recorded in this return?

A. The day and month on which each man performed his preliminary drills, and the points obtained at the several distances.

Q. When men cease to be borne on the strength of the company, what is to be done?

A. A fine line is to be ruled through their names and performances, and the date and cause specified opposite each in the remarks.

Q. How are you to determine the number of points to be deducted on account of non-effective men who have practised in file, and volley, and skirmishing?

A. By multiplying the "mean average of points" by the number of non-effective men, which will give the points to be deducted on their account in the Recapitulation Table.

Q. When are the totals at the foot of the return, and in the Recapitulation Table, to be inserted in ink?

A. At the conclusion of the year's practice, when the *annual* returns are to be prepared and forwarded to the Inspector General of Instruction.

Q. Who is held responsible for the correct keeping of "The Musketry Drill and Practice Return?"

A. The captain of the company.

Q. When men are transferred, is a memorandum of their performances to be sent with them?

A. Yes: and it is to be signed by the captain of the *company and officer* instructor.

Q. What are the shots fired by every man of a section, at two distances, recorded in?

A. A Target Practice Register.

Q. How are the men's names to be entered in this register?

A. Successively, as they appear in the "Musketry Drill and Practice Return," with the succession number of said return prefixed to each.

Q. How is the cause of absence of men who have not practised to be specified in this register?

A. As briefly as possible, in the columns, "Total Points," and "Duplicate Total Points."

Q. When the day's practice has been performed, what becomes of the registers?

A. They are to be endorsed and filed, the captain of the company being responsible for their safe keeping.

Q. What is the weight of the infantry rifle, with bayonet?

A. Ten pounds and one quarter of an ounce.

Q. Without?

A. Nine pounds, three and one fourth ounces.

Q. What is the length of the rifle with bayonet

A. Six feet and one eighth of an inch.

Q. Without?

A. Four feet, seven and one eighth of an inch.

Q. What is the length of the bayonet beyond the muzzle?

A. One foot five inches.

Q. What is its weight?

A. Thirteen ounces.

Q. What is the weight of the scabbard?

A. Four ounces.

Q. What is the weight of the barrel?

A. Four pounds, four ounces.

Q. What is its length?

A. Three feet, three inches.

Q. What is the diameter of the bore?

A. Decimal 577 of an inch.

Q. What is the windage?

A. Decimal 027 of an inch.

Q. How many grooves has it?

A. Three.

Q. What description?

A. Progressive.

Q. What is the width of them?

A. Decimal 262 of an inch.

Q. What is the depth of them?

A. Decimal 005 of an inch at muzzle, ·015 at breach.

Q. What degree of spirality have they?

A. One turn in six feet, six inches.

Q. What is the description of bullet used?

A. The plug bullet.

Q. What is its weight?

A. Five hundred and thirty grains.

Q. What is its diameter?

A. Decimal 55 of an inch.

Q. What is its length?

A. 1 decimal 09 of an inch.

Q. What is the charge of powder?

A. Two and a half drams.

Q. What is the weight of sixty rounds and seventy-five caps packed?

A. Five pounds, eight ounces, four drams.

FINIS.

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